

Title (en)
METHOD FOR CRUSHING CELL

Title (de)
VERFAHREN ZUM ZERKLEINERN VON BATTERIEN

Title (fr)
PROCEDE DE BROUAGE DE PILES

Publication
EP 1041659 A1 20001004 (EN)

Application
EP 99944842 A 19990927

Priority
• JP 9905255 W 19990927
• JP 27297398 A 19980928
• JP 11780299 A 19990426

Abstract (en)
This invention provides a safe and efficient method of dismantling used lithium ion batteries. More specifically, the plastic cases which protect sealed battery cells are removed from the system in a stable and reliable fashion. Valuable materials such as lithium cobalt oxide, an oxide of a lithium-transition metal compound, aluminum and copper must be separated and recovered. The invention is distinguished by the fact that it entails the following processes. In the crushing process, the batteries are chilled to a temperature of -50 DEG C or lower. In this state they are repeatedly subjected to vibration and pressure by a number of objects whose rigidity and specific gravity are greater than those of the plastic. In this way the batteries are separated into sealed battery cells and plastic cases. In the heating process, the sealed battery cells separated in the process are heated to a temperature of at least 200 DEG C in a non-oxidizing atmosphere to separate mainly the organic materials. Finally, in one or more separation processes, the useless materials are removed and the targeted valuable materials are separated in a sequential fashion from the crushed fragments produced in the crushing process. <IMAGE>

IPC 1-7
H01M 10/54

IPC 8 full level
C22B 7/00 (2006.01); **C22B 26/12** (2006.01); **H01M 10/54** (2006.01)

CPC (source: EP US)
C22B 7/005 (2013.01 - EP US); **C22B 26/12** (2013.01 - EP US); **H01M 10/54** (2013.01 - EP US); **H01M 10/05** (2013.01 - EP US); **Y02E 60/10** (2013.01 - EP); **Y02P 10/20** (2015.11 - EP US); **Y02W 30/84** (2015.05 - EP US)

Citation (search report)
See references of WO 0019557A1

Cited by
CN110233303A; GB2424651A; CZ302457B6; EP2975686A1; US11482737B2; EP3836288A1; WO2010149611A1; WO2024003541A1; WO2024148305A1; EP2450991A1

Designated contracting state (EPC)
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

DOCDB simple family (publication)
WO 0019557 A1 20000406; CA 2311792 A1 20000406; EP 1041659 A1 20001004; JP 3495707 B2 20040209; US 6524737 B1 20030225

DOCDB simple family (application)
JP 9905255 W 19990927; CA 2311792 A 19990927; EP 99944842 A 19990927; JP 2000572960 A 19990927; US 55526400 A 20000725